

DOCKET NO.: SHIO-0046

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Tamohide Takami**

Confirmation No.: **7127**

Serial No.: **10/726,370**

Group Art Unit: **1792**

Filing Date: **December 3, 2003**

Examiner: **Matthew J. Song**

For: **NANOFIBER AND METHOD OF MANUFACTURING NANOFIBER**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

**APPELLANT'S REPLY BRIEF
PURSUANT TO 37 C.F.R. § 41.41 AND M.P.E.P. § 1208**

Appellant submits this Reply Brief in response to the Examiner's Answer dated November 9, 2007 in connection with the above-identified application. This reply is being filed within two months of said answer.

1. STATUS OF CLAIMS

Pending	:	Claims 1 to 9
Rejected	:	Claims 1 to 9
Objected to	:	None
Allowed	:	None
Withdrawn	:	None
Appealed	:	Claims 1 to 9.

2. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issues on appeal are as follows:

- whether claim 3 is unpatentable under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement with respect to the disclosure in the original specification of a nanofiber possessing a joint having a diameter less than that of the portions of the nanofiber preceding and following the joint;
- whether claim 5 is unpatentable under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement with respect to the disclosure in the original specification of a nanofiber having a diameter that is approximately equivalent to the size of the microcrystal grain from which it is formed;
- whether claims 1-4 and 6-9 are unpatentable as being anticipated under 35 U.S.C. § 102(b) by U.S. Pat. No. 5,858,862 to Westwater et al. (“the Westwater patent”); and,
- whether claims 1-2 are unpatentable as being anticipated under 35 U.S.C. § 102(b) by U.S. Pat. No. 5,381,753 to Okajima et al. (“the Okajima patent”).

3. ARGUMENTS

Rejection of Claim 3 Under 35 U.S.C. § 112, First Paragraph

Appellant respectfully submits that the Examiner's Answer does not reasonably support the present rejection at least because (1) the patent laws do not require verbatim support and (2) those skilled in the art reading the instant specification would readily understand that Appellant was in possession of the claimed subject matter. The Examiner's Answer does not provide sufficient basis for doubting that the present inventors were in possession of a nanofiber featuring a joint having a diameter less than that of the portion of the nanofiber preceding the joint and less than that of the portion of the nanofiber following the joint. Accordingly, the Examiner has not met its burden to provide reasons for the alleged lack of written description of currently pending claim 3, and the instant rejection under 35 U.S.C. § 112, first paragraph, should be withdrawn.

It is well established, for example, that the written description requirement does *not* require a patent applicant to provide a verbatim description of his claimed invention. *Union Oil Co. Of Cal. v. Atl. Richfield Co.*, 208 F.3d 989, 997-1001 (Fed. Cir. 2000). Rather, the test for sufficiency of support in a patent application is whether an applicant's disclosure "reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter." *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563 (Fed. Cir. 1991) (citing *Ralston Purina Co. v. Far-Mar-Co, Inc.*, 772 F.2d 1570, 1575 (Fed. Cir. 1985)).

There can be no genuine dispute that Appellant's instant specification satisfies this standard. The Examiner concedes that the specification teaches that "the diameter of silicon nanofiber 4 will be configured with a small joint" (Examiner's Answer at page 5), and that a "slight indentation" encircles the circumference of the nanofiber depicted in Figure 4 (*id.* at page 6). Thus, the fact that Appellant was in possession of an invention involving a nanofiber having a small joint comprising a circumferential constriction, and that such constriction results in a portion of the nanofiber that has a smaller diameter than those portions of the nanofiber that precede and follow the constriction is beyond genuine dispute.

The Examiner contends that the recitation of a "small joint" does not provide support "for the diameter of the nanofiber preceding and following the joint", because "[s]mall joint" can be interpreted to mean its length, i.e., short joint" (Examiner's Answer at page 5). However, this argument places undue emphasis on the issue of the meaning of the word

“small” and ignores the fact that literal, verbatim support for the joint recited in claim 3 is unnecessary, as long as the instant specification reasonably conveys to one skilled in the art that the present inventors were in possession of the claimed invention. One skilled in the art would readily appreciate how the described heat releasing process during the preparation of the instant nanofiber would cause the diameter of the nanofiber to be configured with a joint having the characteristics recited in claim 3 (*see* specification at page 10, lines 28-29). The fact that there exist ways to interpret the word “small”, and hence the word “joint”, in a manner that would be inconsistent with the context in which those words appear is inapposite to the present inquiry in view of the fact that claims must be interpreted in light of the specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (*en banc*). Thus, to the extent that the Examiner has argued that in the absence of *in haec verba* support for a joint as recited in claim 3, there is no written description for that claim limitation because one could interpret the phrase “small joint” in a manner that is inconsistent with every other teaching of the present specification, the Examiner has applied a grossly improper written description standard.

Likewise, the Examiner applies an undue written description standard in addressing whether Figure 4 of the instant application discloses a “joint” as presently claimed.

First, the Examiner contends that “there is no support” for the Appellant’s assertion that the portion of Figure 4 indicated by the white arrow (*see* Appellant’s Brief at page 4) represents a joint as described in the specification and as recited in claim 3 (*see* Examiner’s Answer at page 6). This contention improperly attempts to allocate the burden of proving compliance with the written description to the Appellant without first presenting objective evidence that the written description requirement has not been met. *See, e.g., In re Marzocchi*, 439 F.2d 220, 224 (C.C.P.A. 1971) (a written description as filed is presumed to be adequate, unless or until sufficient evidence or reasoning to the contrary has been presented by the examiner to rebut the presumption). The Examiner has presented no evidence or reasoning to support the conclusion that Figure 4 and the description thereof in the instant specification (*e.g.*, at page 10, lines 26-29) does not reasonably convey to one skilled in the art that the nanofiber depicted in Figure 4 features a joint, and such conclusion therefore has no proper bearing on the present inquiry.

Second, the Examiner contends that because of the presence of “portions [that] bulges out . . . on the opposite side of the indentation”, it is “impossible to determine” whether the

joint depicted in Figure 4 has a diameter that is smaller than the portions of the nanofiber preceding and following the joint (Examiner's Answer at page 6). This contention actually supports Appellant's position (*i.e.*, by conceding the joint has a smaller diameter than the "bulging" portions) by ignoring the fact that the "bulges" to which the Examiner refers are part of the nanofiber and if anything, serve to increase the relative difference between the diameter of the nanofiber and the diameter of the joint. Also, the assertion that the relative diameter of the joint depicted in Figure 4 is "impossible to determine" is unsupported by objective evidence or reasoning to contradict the presumption that Figure 4 reasonably conveys to one skilled in the art that the present inventors possessed a nanofiber comprising the joint recited in claim 3. To the contrary, a simple visual inspection of Figure 4 as reproduced in Appellant's Brief reveals a constriction at the portion of the nanofiber designated by the white arrow. Even if the constriction is more prominent on one lateral side of the nanofiber, the overall diameter of the constriction is clearly less than that of the portions of the nanofiber preceding and following the constriction, respectively.¹ Figure 4 reasonably conveys to one skilled in the art that the present inventors were in possession of nanofibers having a joint as recited in claim 3. *Lockwood v. Am. Airlines Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997) (possession is shown by describing the claimed invention with all of its limitations using such descriptive means as, *inter alia*, words and figures).

For at least these reasons, it is clear that claim 3 complies with the objective standard for the written description requirement, and the Examiner has failed to produce a reasonable basis for challenging the adequacy of the written description with respect to the rejected claim. Appellant respectfully submits that the rejection of claim 3 under 35 U.S.C. § 112, first paragraph, should be withdrawn.

Rejection of Claim 5 Under 35 U.S.C. § 112, First Paragraph

Appellant respectfully submits that the Examiner's Answer does not provide sufficient basis for doubting that the present inventors were in possession of a nanofiber having a diameter that is approximately equal to the size of a heated silicon microcrystal grain placed on the surface of a silicon substrate.

¹ Appellant also disagrees with the Examiner's assertion that it "appears that the upper portion [of the nanofiber] . . . actually is of smaller diameter than the . . . joint portion" (Examiner's Answer at page 6). Figure 4 clearly depicts a nanofiber having an annular joint that is visibly constricted relative to both the preceding and succeeding portions of the nanofiber.

The test for sufficiency of support in a patent application is whether an applicant's disclosure "reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter." *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563 (Fed. Cir. 1991) (citing *Ralston Purina Co. v. Far-Mar-Co, Inc.*, 772 F.2d 1570, 1575 (Fed. Cir. 1985)). There can be no genuine dispute that Appellant's instant specification satisfies this standard. Indeed, the Examiner concedes that the specification provides "literal support" for a silicon nanofiber having a diameter that is approximately equivalent to the size of a nanocrystal grain (Examiner's Answer at page 6).

However, the Examiner contends that, despite enjoying literal support in the specification as filed, claim 5 does not satisfy the written description requirement because "the invention cannot perform as claimed" (*id.*). First, it is unclear how the Examiner's contention is relevant to a claim that the Examiner and Appellant mutually agree is fully supported by the specification as filed. *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565 1573 (Fed. Cir. 1997) (an applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as, *inter alia*, words that fully set forth the claimed invention). Second, the reasoning offered by the Examiner does not support the conclusion that the invention allegedly cannot perform as claimed. The Examiner's reasoning seems to be that because Figure 3 suggests that "the nanofiber has a diameter approximately equivalent to the sum of the diameters of the nanowires" (Examiner's Answer at page 7)², the nanofiber cannot also have a diameter that is approximately equivalent to the size of the microcrystal grain, as recited in claim 5. However, this conclusion is not supported by any evidence or reasoning of record. To the contrary, as described in the present specification, Figure 1 depicts how by "placing microcrystal grains 2 . . . on the surface of substrate 1", substrate 1 "causes nanowires to grow and form nanofibers 4" (*see* specification at page 5, lines 4-9 & Figure 1). Thus, in accordance with the present invention, an aggregate of nanowires grows from a microcrystal grain and in turn forms a nanofiber, *i.e.*, the diameters of the microcrystal, the aggregation of nanowires, and the nanofibers are all proportionally related. The Examiner has not presented evidence to support its contention to the contrary, and accordingly, the Examiner has not met its burden to provide reasons for the alleged lack of written description of currently pending claim 5, and the instant rejection under 35 U.S.C. § 112, first paragraph, should be withdrawn.

² A point that is not conceded by the Appellant but is assumed to be the case only for the sake of the present argument.

*Rejection of Claims 1-4 and 6-9 Under 35 U.S.C. § 102(b) Over the Westwater Patent***Claims 1 and 2**

The Examiner's position that the Westwater patent inherently discloses a nanofiber comprising bundled nanowires and having a stem shaped cross-sectional configuration is conjectural and not based on any objective evidence found in the Westwater patent or elsewhere, and even if true, does not result in any claimed invention.

The Examiner erroneously characterizes the "bundled" limitation as an unclaimed limitation (*see, e.g.*, Examiner's Answer at page 8), when it is abundantly clear from the language of claim 1 that "bundled" is literally present in the claim and used to describe how the recited silicon of which the nanowires comprise is oriented in the claimed nanofibers. The Examiner also repeatedly erroneously characterizes the "bundled" limitation in claim 1 as a process limitation (*see, e.g.*, Examiner's Answer at page 7 & page 8), when in fact it is a structural limitation describing the configuration of the recited silicon. The Examiner argues that "bundling occurs simply by . . . having a plurality of nanowires grow parallel to one another" (*id.* at page 8), but such argument fails to properly construe the language of claim 1 in light of the instant specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (*en banc*) ("the claims 'must be read in view of the specification, of which they are a part.'"). The instant specification and Figure 3 clearly show how, after adjacent nanowires are grown at the location of the silicon microcrystal grain, liquefied silicon rises between the silicon nanowires due to capillary action (*see* specification at page 10 & Figure 3). Thus, "in this way **numerous nanowires . . . aggregate in a bundle** and nanofiber 4 having a structure provided with gaps between nanowires 5 so that its cross-sectional configuration is stem-shaped is obtained" (*id.*; emphasis added). Instant claim 1 includes structural limitations that reflect the physical result of this process, *i.e.*, "stem shaped" nanofibers comprising an aggregation of "bundled" silicon nanowires.

Accordingly, the Examiner is incorrect that "bundling occurs simply by . . . having a plurality of nanowires grow parallel to one another" (*id.* at page 8), because the term "bundled" in claim 1 describes a specific, aggregated configuration of nanowires that result from the nanofiber-forming process described in the instant specification. Figure 3 of the Westwater patent merely depicts a field of isolated, unaggregated silicon quantum fine wires, and there is no evidence of record that the isolated nanowires disclosed by the Westwater

patent are “bundled” in accordance with the proper construction of that term in light of the instant specification. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989) (to anticipate a claimed invention, “[t]he identical invention must be shown in as complete detail as is contained in the . . . claim”); *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984) (in deciding the issue of anticipation, the trier of fact must identify the elements of the claims, determine their meaning in light of the specification and prosecution history, and identify corresponding elements disclosed in the allegedly anticipating reference).

Likewise, the Examiner’s Answer fails to provide any support for the allegation that by disclosing a “plurality of nanowires in Figure 3”, the Westwater patent necessarily inherently discloses a stem-shaped nanofiber in accordance with claim 1 (Examiner’s Answer at page 8), or for the conjecture that the “band or group of the nanowires [disclosed in the Westwater patent] . . . would have a stem shaped cross section” (*id.* at page 9). *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295 (Fed. Cir. 2002) (it is not sufficient for anticipation if a material element or limitation is “merely probably or possibly present” in the prior art); *W.L. Gore v. Garlock, Inc.*, 721 F.2d 1540, 1554 (Fed. Cir. 1983) (anticipation “cannot be predicated on mere conjecture respecting the characteristics of products that might result from the practice of processes disclosed in references”); *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (“In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.”) (emphasis in original).

Accordingly, the present rejection of claims 1-2 for alleged anticipation by the Westwater patent is not supported by adequate evidence or reasoning and should be withdrawn.

Claims 3, 4, and 6-9

Claims 3, 4, and 6-9 are not invalid under 35 U.S.C. § 102(b) over the Westwater patent because the cited reference does not disclose a nanofiber of which a portion forms a joint having a diameter less than that of the portion of the nanofiber preceding the joint and less than that of the portion of the nanofiber following the joint. The Examiner’s conclusion that the Westwater patent inherently discloses a nanofiber having a joint as presently claimed is unsupported by any objective evidence and results from pure conjecture. In addition, the

Examiner's conclusion that the Westwater patent discloses a "joint" as recited in claim 3 results from the Examiner's refusal to construe the term "joint" in accordance with the legal requirements of claim construction.

It is not the case, and the Examiner does not contend, that the Westwater patent discloses nanofibers of any kind, much less nanofibers having a joint portion. The Westwater patent discloses "quantum fine wires" (also called "silicon nanowires"), which are *not* nanofibers. Instead, the Examiner contends that the disclosure of the Westwater patent of nanowires is tantamount to a disclosure of a nanofiber because "a nanofiber is merely a plurality of nanowires" (Examiner's Answer at page 11), and that, in accordance with claim 3, the nanowires need not be "bundled" (*id.*; "appellant's claim 3 does not require any 'bundling'"). However, the instant specification clearly provides that "[t]he nanofiber produced by method of the invention comprises numerous silicon nanowires which are oriented and bundled in the same direction . . ." (page 3, lines 27-28). Thus, the instant nanofibers are defined as comprising bundled nanowires. *AquaTex Indus. v. Techniche Solutions*, 419 F.3d 1374, 1380 (Fed. Cir. 2005) ("Where, as here, the disputed claim term is technical or a term of art, 'the best source for understanding [it] is the specification from which it arose, informed, as needed, by the prosecution history.'"). The Westwater patent does not disclose or suggest bundled nanowires, and therefore cannot be said to disclose nanofibers, much less nanofibers having a "joint."

Even if it were conceded for the sake of argument that the Westwater patent does disclose nanofibers (and the Appellant maintains that there is no such disclosure in the Westwater patent), there is no disclosure in the Westwater patent of a "joint" in accordance with the proper construction of that claim term. The Examiner continues to construe claim 3 improperly, namely, by effectively reading the term "joint" out of the claim and maintaining that any structure "having a diameter less than that of the portions of the nanofiber preceding and following" such structure will meet the requirements of claim 3; the Examiner's only contention regarding anticipation of the "joint" element is that the Westwater patent "teaches a portion that is wide at the base then constricts during a main elongated portion then expands at the top, wherein the smaller diameter main portions reads on appellant's joint" (Examiner's Answer at page 10). However, it is clear from the wording of claim 3 that the "joint" is a distinct structure, one characteristic of which is having a diameter less than that of the

portions of the nanofiber preceding and following the joint.³ The Examiner refuses to construe the term “joint” in light of the instant specification, and instead applies such a narrowed construction that “joint” is effectively read out of the claims. *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984) (in deciding the issue of anticipation, the trier of fact must identify the elements of the claims, determine their meaning in light of the specification and prosecution history, and identify corresponding elements disclosed in the allegedly anticipating reference); *Verdegaal Bros. v. Union Oil Co. of Calif.*, 814 F.2d 628, 631 (Fed. Cir. 1987) (“A claim is anticipated only if each and every element in the claims is found, either expressly or inherently described, in a single prior art reference”).

In its Appeal Brief, the Appellant provided four reasons why the term “joint” cannot be construed in light of the instant specification simply to mean any structure “having a diameter less than that of the portions of the nanofiber preceding and following [such structure]” (including the central portion of the nanowire disclosed in the Westwater patent) (*see* Appeal Brief at pages 8-9). Appellant’s arguments do not represent improper attempts to import limitations from the specification into claim 3, but rather demonstrate that when construed in light of the specification, the recited “joint” cannot be interpreted to comprise a structure that is the same as the central portion of the nanowire disclosed in the Westwater patent. A proper anticipation analysis cannot be conducted without construing the term “joint” in light of the specification and prosecution history (*Lindemann Maschinenfabrik GMBH*, 730 F.2d at 1458), and the Examiner’s argument is clearly based on a failure to construe that term in the proper contextual setting of the specification and prosecution history. *See also Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (*en banc*) (“the claims ‘**must** be read in view of the specification, of which they are a part.’”) (emphasis added).

In response to Appellant’s argument that a “joint” as defined in the current application is “small”, *i.e.*, relative to the total size of the nanofiber (Appeal Brief at page 8), the Examiner argues that “appellant does not claim a small joint” (Examiner’s Answer at page

³ Claim 3 uses the term “joint” in two contexts, first to establish that the structure is present in the claimed nanofiber, and second to describe a characteristic of the joint: “. . . a portion of the nanofiber forming *a joint* aligned with the axis, *the joint* having a diameter less than that of the portions of the nanofiber preceding and following the joint” (emphasis added). Construing the “joint” as any structure “having a diameter less than that of the portions of the nanofiber preceding and following” such structure effectively reads the first recitation of the term “joint” out of claim 3.

10). The Appellant did not intend to suggest that “small” should be read into claim 3, but rather to demonstrate that the specification clearly indicates that the “joint” is a relatively diminutive portion of the nanofiber that results from a brief heat releasing period, unlike the elongated middle portion of the nanowire in the Westwater patent to which the Examiner refers as allegedly representing a “joint”. The terms “small joint” and “joint” are essentially interchangeable, because the instant specification describes that “[w]hen heating is interrupted by the heat releasing period, the diameter of silicon nanofiber 4 will be configured with a small joint”, *i.e.*, the “small joint” is the result of the heat releasing process. The Examiner disputes that the term “small” is used to describe the relative size of the joint as compared with the nanofiber as a whole, stating that “all the invention is on the nanometer size so everything about the invention is small” (Examiner’s Answer at page 10; emphasis added). The Examiner’s response actually supports Appellant’s position, because if “everything about the invention is small”, then the term “small” as used in the instant specification must refer to the size of the joint relative to the size of every other aspect of the present “nanometer size” structure. Furthermore, one skilled in the art would recognize the relationship between the effect of the heat releasing step described in the present specification and the characteristics of the joint that is formed as a result thereof, and in turn understand that the elongated middle portion of the nanowire disclosed in the Westwater patent would not result from such a process and is not “joint” in accordance with the proper construction of that term. *CollegeNet, Inc. v. ApplyYourself, Inc.*, 418 F.3d 1225, 1231 (Fed. Cir. 2005) (“the inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation.”) (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*)).

Lastly, the Examiner asserts that even though the Westwater patent indisputably fails to teach or suggest nanofibers, much less nanofibers that are configured with a “joint”, a nanofiber with a joint is inherently disclosed because the nanowires taught by the Westwater patent “have a flared base and flared top with a smaller diameter portion between the flared portion[s]”, and “because a nanofiber is merely a plurality of nanowires, that the nanofiber would also have the flared top and bottom portions” (Examiner’s Answer at page 11), and any resulting nanofiber “will take on the properties of the nanowires [of which] the nanofiber is composed” (*see* 12/01/2006 Advisory Action at page 2). Appellant has already demonstrated that the “smaller diameter portion” of the nanowires disclosed by the Westwater patent is not a “joint” in accordance with the proper construction of that term.

Thus, any aggregation of the nanowires disclosed in the Westwater patent would not possess a “joint”. Furthermore, the instant specification clearly provides that “[t]he nanofiber produced by method of the invention comprises numerous silicon nanowires which are oriented and bundled in the same direction . . .” (page 3, lines 27-28). Thus, the instant nanofibers are defined as comprising bundled nanowires. *AquaTex Indus. v. Techniche Solutions*, 419 F.3d 1374, 1380 (Fed. Cir. 2005) (“Where, as here, the disputed claim term is technical or a term of art, ‘the best source for understanding [it] is the specification from which it arose, informed, as needed, by the prosecution history.’”). The Westwater patent does not disclose or suggest the bundling or aggregation of nanowires, and therefore cannot be said to disclose nanofibers, much less nanofibers having a “joint.” Finally, the Examiner (either in Examiner’s Answer or elsewhere) fails to supply any objective evidence or reasoning for its contention that the Westwater patent inherently teaches a nanofiber having a joint. The Examiner posits that combining the nanowires disclosed in the Westwater patent would both 1) result in a nanofiber and 2) produce a nanofiber that takes on the properties of the nanowires of which it is composed, including the elongated middle portion that is improperly alleged to constitute a joint. However, the Westwater patent does not teach anything other than isolated nanowires (*Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989) (“The identical invention must be shown in as complete detail as is contained in the . . . claim”)), and furthermore, the Examiner has failed to demonstrate that it would inherently be the case that a nanofiber having a “joint” would result from the aggregation of the nanowires disclosed in the Westwater patent. *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295 (Fed. Cir. 2002) (it is not sufficient for anticipation if a material element or limitation is “merely probably or possibly present” in the prior art); *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (“In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.”) (emphasis in original).

The Examiner’s argument falls far short of what is required to demonstrate anticipation under 35 U.S.C. § 102(b). Accordingly, the rejection of claims 3, 4, and 6-9 for alleged anticipation over the Westwater patent should be withdrawn.

Rejection of Claims 1-2 Under 35 U.S.C. § 102(b) Over the Okajima Patent

The Examiner's argument as to why the Okajima patent allegedly anticipates claims 1-2 of the present application is essentially the same as the argument that was posited with respect to the Westwater patent, namely, that because the Okajima patent discloses a plurality of nanowires that are oriented parallel to one another, and because a nanofiber "is merely a bundle of nanowires", and "a bundle is merely a band of mostly parallel fibers", the Okajima patent inherently discloses a nanofiber having a stem shaped cross-sectional configuration in accordance with claim 1 (Examiner's Answer at page 12).

The Examiner cites Figure 1(b) of the Okajima patent as alleged support for the argument that the Okajima patent inherently discloses a nanofiber in accordance with the present invention (*see* Examiner's Answer at page 12: "The nanowires taught by Okajima are oriented parallel to one another in Figure 1(b). The nanofiber claimed by appellant is merely a bundle of nanowires, which is taught by Okajima because a bundle is merely a band of mostly parallel fibers"). First, by the Examiner's reasoning, any group of parallel nanowires would necessarily comprise a nanofiber, *i.e.*, a bundle of nanowires (*see* specification at page 3, lines 27-28), which one skilled in the art would readily appreciate not to be the case. Second, simply stating that a nanofiber is nothing more than a group of parallel nanowires, regardless of how the nanowires are spaced or of the other physical relationships between the nanowires, does not make it so; in fact, one skilled in the art would readily appreciate that the Examiner's proposed reasoning is inconsistent with the present specification and the knowledge of those skilled in the nanostructure art. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (*en banc*) ("the claims 'must be read in view of the specification, of which they are a part.'"); *Id.* at 1313 (the person of ordinary skill in the art views the claim term in the light of the entire intrinsic record); *AquaTex Indus. v. Techniche Solutions*, 419 F.3d 1374, 1380 (Fed. Cir. 2005) ("Where, as here, the disputed claim term is technical or a term of art, 'the best source for understanding [it] is the specification from which it arose, informed, as needed, by the prosecution history.'"). The instant specification and Figure 3 clearly show how, after some adjacent nanowires are grown at the location of the silicon microcrystal grain, liquefied silicon rises between the silicon nanowires due to capillary action (*see* specification at page 10 & Figure 3). Thus, "in this way **numerous nanowires . . . aggregate in a bundle** and nanofiber 4 having a structure provided with gaps between nanowires 5 so that its cross-sectional configuration is stem-shaped is obtained" (*id.*; emphasis added). Instant claim 1 includes structural limitations that reflect the physical result

of this process, *i.e.*, “stem shaped” nanofibers comprising an aggregation of “bundled” silicon nanowires.

Accordingly, the Examiner is incorrect that “a bundle is merely a band of mostly parallel fibers” (Examiner’s Answer at page 12), because the term “bundled” in claim 1 describes a specific, aggregated configuration of nanowires that result from the nanofiber-forming process described in the instant specification. Figure 1(b) of the Okajima patent merely depicts a field of isolated, unaggregated nanowires, and there is no evidence of record that the isolated nanowires disclosed by the Okajima patent are “bundled” in accordance with the proper construction of that term in light of the instant specification. *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984) (in deciding the issue of anticipation, the trier of fact must identify the elements of the claims, determine their meaning in light of the specification and prosecution history, and identify corresponding elements disclosed in the allegedly anticipating reference).

Additionally, the Examiner perfunctorily asserts that “[t]he pattern of nanowires taught by Okajima [in Figure 1(b)] reasonably resembles a plant stem and thus meets the claimed limitation of a stem [shaped] cross section” (Examiner’s Answer at page 12). To the extent that a field of isolated, spaced-apart nanowires can have any “cross-sectional configuration” at all, a visual inspection of Figure 1(b) in the Okajima patent does not reveal any particular cross-sectional configuration, much less a stem-shaped configuration as presently claimed. The Examiner is not permitted to vitiate the element of claim 1 requiring a “stem shaped cross-sectional configuration” by concluding that because that element is not specifically defined in the instant specification, it can be anticipated by any arrangement of nanowires. The Examiner’s conclusory statement regarding the alleged cross-sectional configuration of the isolated, unaggregated nanowires depicted in Figure 1(b) of the Okajima patent does not suffice to demonstrate that a nanofiber having a stem shaped cross-sectional configuration is taught or suggested by the cited reference. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989) (for a reference to anticipate a claimed invention, “[t]he identical invention must be shown in as complete detail as is contained in the . . . claim”).

Accordingly, the Examiner has not shown that the Okajima patent expressly or inherently discloses a nanofiber, much less a nanofiber having a stem shaped cross-sectional configuration, and for at least these reasons, the rejection of claim 1 for alleged anticipation should be withdrawn. *Verdegaal Bros. v. Union Oil Co. of Calif.*, 814 F.2d 628, 631 (Fed.

Cir. 1987) (“A claim is anticipated only if each and every element in the claims is found, either expressly or inherently described, in a single prior art reference”). Claim 2, which includes all of the limitations of claim 1, is likewise not anticipated by the Okajima patent.

Conclusions

The Examiner’s Reply does not suffice to show that the present rejections of the appealed claims under 35 U.S.C. § 112, first paragraph, and 35 U.S.C. § 102(b) are proper. Appellant requests that this patent application be remanded to the Patent Office with an instruction to withdraw the rejections of the claims under 35 U.S.C. § 112, first paragraph, and 35 U.S.C. § 102(b), and allow the appealed claims.

Respectfully submitted,

Date: January 8, 2008

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